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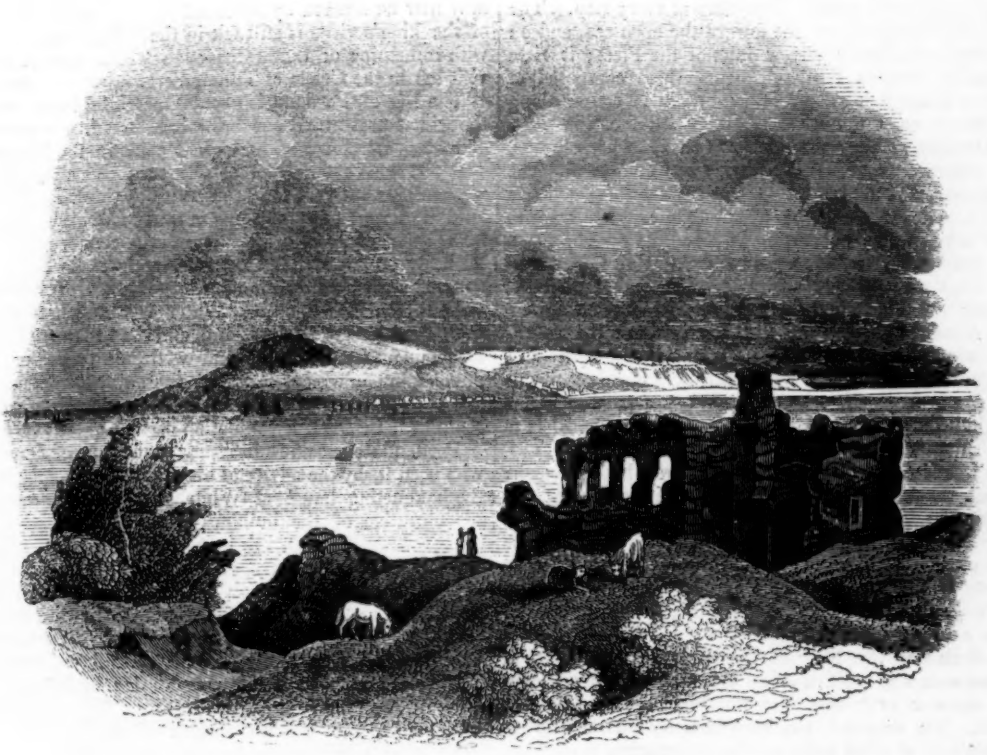
ISLE OF PORTLAND.



[View of Portland, from Sandsfoot Castle.]

A WEEK IN THE ISLE OF PORTLAND IN 1837.

[From a Correspondent.]

DESIROUS of enjoying a little relaxation from the business and bustle of London, I resolved, in the month of June last, to go down to Dorsetshire, and spend a few days in the Isle of Portland. "Portland stone" was a subject of some interest to me. I saw it daily as I passed St. Paul's, or crossed Blackfriars Bridge—while the extensive repairs rendered necessary in the latter structure (Penny Mag., No. 275), drew my attention still more strongly towards the nature and commercial history of a material, which enters largely into the composition of many of the public edifices of the metropolis which were built immediately after the great fire of London. Such of your readers as may glance at a map—say, the Society's map of the western part of England—will remark that the Isle of Portland seems to be in shape not unlike a breast of mutton suspended from the mainland by a string. This is rather an odd sort of comparison; but it is, I think, a very fair one, bearing in mind that a map exhibits only a flat surface. Old writers affirm that Portland was once separated from the coast of Dorsetshire, and that it was, therefore, really an island: but now it is joined by a ridge which I have likened to a string. It is called the Chesil Bank, and an extraordinary bank it is. Its surface or upper portion is composed of rounded loose pebbles, resting on hard blue clay. From the northern extremity of the Isle of Portland it runs along the coast of Dorsetshire, separated from it by a narrow channel or arm of the sea, to near Abbotsbury, ten miles from Portland; it then joins the land, and forms the outline of the Dorset coast, from Abbotsbury to near Bridport, a distance of about six miles. Chesil Bank is in some places about a quarter of a mile broad, but its general breadth is much less. Mr. Smeaton, the engineer of Eddystone Lighthouse, thought it had been formed at a comparatively recent period: "but it is very difficult to account satisfactorily either for its first formation or its continued existence. There is a similar and still more extensive ridge, bounding the Frische Haf, on the coast of Prussia."*

Weymouth has been already described in the 'Penny Magazine' (vol. vi., No. 321); I shall only, therefore, remark, that the bay between it and the Isle is called Portland Road; and that it is this bay which in the wood-cut above is represented as lying between Sandsfoot Castle and Portland. Sandsfoot Castle (old spelling,

* M'Culloch's 'Statistical Account of the British Empire,' vol. i., p. 64. See also the 'Penny Cyclopædia,' article DORSETSHIRE.

Sandes Foote) was built by Henry VIII. It is now, as the wood-cut represents it, a ruin. The usual approach from Weymouth to Portland is by Sandsfoot Castle and Smallmouth Sands,—Small-mouth being the name of the mouth of the narrow channel between the coast of Dorset and the Chesil Bank. A walk of a mile on the Smallmouth Sands conducts the tourist to a ferry, where, for a penny, he is rowed across the "Fleet" to the Chesil Bank. Here he may remark the nature of this curious ridge. The pebbles by which it is covered to the depth of four, five, and six feet, are chiefly of a white calcareous spar (these are called Portland pebbles), but partly of quartz, chert, jasper, &c., so loose that a horse's legs sink almost knee-deep at every step. The bank slopes on the one side toward the open sea, and on the other towards the narrow inlet of the Fleet; it rises gradually towards Portland, being there composed of pebbles as large as swans' eggs; but in its course along the Dorset coast the stones gradually diminish in size; at Abbotsbury they are about the size of horse-beans, and more westward they degenerate into mere sand. The smugglers, who used to land at night, were thus furnished with a natural gauge, by which they could tell where they were, whether near to Portland, or on the coast. The pebbly covering is continually shifting; a north-east wind sometimes clears away the pebbles in parts, leaving the blue clay exposed, but the bare spaces are soon covered again by the heavy sea which the south-west wind drives against the bank. At the north-west extremity of the Chesil Bank there was once a "Swannery," consisting of several thousand swans; wild swans still build in the neighbouring swamps, and the Fleet is much frequented by different kinds of water-fowl.

It was late in the afternoon when I was landed on the Chesil Bank; the sun was setting, and the evening was delightful: but I must confess that my thoughts were as much occupied with a speculation on the nature of the accommodation I might meet in Portland, as with the beauty of the scene. Before me rose the Isle, sloping upwards from the Chesil Bank, but presenting on other sides a precipitous front to the sea; and westward from the Bank was the Race of Portland, the turbulence of whose waters is typified on an old map by a fierce-looking monster or "sea-dragon" lashing the surface into foam. The people of Portland formerly shared with the inhabitants of other parts of the western coasts of England in the odious character of "wreckers." They were said almost instinctively to scent the approach of a storm; and while others might be anxiously breathing a wish that some gallant vessel which had crossed the Atlantic might pass in safety through the Channel, they were reputed nightly to embody their malignant wishes in a couplet—

"Blow wind and rise sea,
Ship ashore 'fore day!"

I knew not how much of this imputed character might be true, or, if it had been true, how much of it was modified by other influences. In this instance I found what we often find through life, that to take the characters of individuals or communities from vague rumour or imperfect data, is an injustice to ourselves as well as to others.

As I approached the end of the Chesil Bank, I distinguished a line of houses disposed along the slope of the rock: this was the village of Fortune's Well, my intended resting-place. On reaching it, my first inquiry was, naturally enough, for an inn; and I was directed to the "Portland Arms," the only house of any repute in the island for "the entertainment of man and beast." Here I met with comfortable quarters and considerate attention. The "Portland Arms" is not a wayside house, where travellers are coming and going every hour, and where, therefore, you have no right to expect more than prompt but general civility. It is rather one of those retired country inns, where visitors are treated with a homely but warm-hearted attention, which places them almost on the footing of friends. And though the inn cannot boast of being as fine as a London hotel, it has, nevertheless, its reputation. George III., during his visits to Weymouth, had several times made a tour of the Isle of Portland; and on those occasions he made the "Portland Arms" his head-quarters, and used to finish his day by dining at the house. The then landlady had a recipe for making a certain famous Portland pudding, and the king never failed to order this pudding, in honour of the island. She bequeathed the recipe to her daughter, the present landlady; and though the pudding may now be ordered by the humblest visitor, the honour of the king's visits is still felt in the "Portland Arms" with something of that satisfaction which another royal visit left in the Castle of Tillietudlem.

The Isle of Portland is about four miles long, and in the widest part nearly one and a half broad. It is a bed or rock of freestone. The highest point in the island is 458 feet above the level of the sea; the cliffs on the western side are very lofty, but those at the Bill of Portland are not more than twenty or thirty feet high. There is sufficient depth of vegetable soil to render the island tolerably productive, but not sufficiently so for the entire sustenance of the inhabitants, who get much of their provisions from Weymouth. Water is somewhat scarce; there is no stream in the island, and the necessary supply is obtained from springs and wells, which are not numerous, but in which, however, the water is copious and good. The whole island is included in one parish, which contained, in 1831, a population of 2670.

Portland stone came into repute in the time of James I., who used it, by the advice of his architects, in rebuilding the banqueting house at Whitehall. Mr. Smeaton, in his narrative of the building of Eddystone Lighthouse (Penny Mag., No. 20, vol. i., p. 163—165), has given a description of the quarries of Portland.

The road from Fortune's Well to the Western Cliff is very steep, and commands fine views of the Chesil Bank and the low but picturesque shores of Western Dorsetshire; and from the top, on a clear day, Torbay in Devonshire may be distinguished. Having attained the summit, the road runs to the right, on the extreme edge of the cliffs, from which a number of smaller roads, recurring at every hundred yards, run between lofty gullies in the face of the rocks, which rise about twenty feet above the main road. These "bye-paths" lead to the Quarries. If the visitor take any one of them, it will lead him through a series of well-stacked piles of sandstone, into a stone-pit of irregular form, measuring perhaps 200 feet or more each way, and shut in by solid walls of variously stratified stone to the height of about sixty feet. The scene is now a beautiful one: blocks of stone as large as good-sized rooms lie tumbled about in the most picturesque confusion—white intermingled with shades of yellow, grey, and red; and enormous orange-coloured stalactites, called by the quarry-men "congealed water," hang from the projecting rocks. Stains, the slow result of various decaying mosses and lichens steeped in the little rills, which are strongly impregnated with iron, give their mellowing hues to the picture. Before the visitor can have had time to express his astonishment at the novelties before him, he may chance to have it still further heightened, by a wild and oft-repeated cry of "*High, high, high, boys, high,*" repeated in tones which to a stranger seem to be those of a madman. This cry proceeds from a party of quarry-men engaged in moving a block of roach-stone from the pit; and as the whole operation of quarrying is now before the stranger's eye, I shall proceed to describe everything worthy of attention.

[To be continued.]

ERASMUS IN ENGLAND.—No. I.

Erasmus was among the great luminaries of the age of the Reformation. He was distinguished as a theologian, as a biblical critic and translator, as a reviver of classical literature, and as an author who diluted and softened down the acrimony of controversy in a dark age, with wit and refinement. His works are contained in ten volumes folio, one of which, of two thousand pages, is occupied with his correspondence. His letters are addressed to the most eminent persons of the period, whether of British or of European reputation; to crowned heads, to Popes, and Cardinals; to the leaders of the Reformation; and to politicians, scholars, and personal friends. The object of this paper is to give a few specimens of his remarks on persons and things in England during the period of his acquaintance with the country.

His first visit to England was in the year 1497, at the age of thirty, to fulfil a promise made to his noble pupil Lord Montjoy, whose liberality he had experienced, but in a degree not equal to his necessities; for he speaks of him as a sincere friend, but insinuates that he was not a bountiful person. In truth, with respect to presents and pecuniary assistance, Erasmus seems to have ridden all his patrons rather hard. Montjoy was a learned man; and was so enamoured of literary intercourse, that he was said never to be happy out of the society of Erasmus whenever that eminent scholar was residing in England. Even after he was married, he left his family and resided in Oxford, solely for the purpose of advancing in his studies under Erasmus's direction. During Montjoy's absence from London, he gave Erasmus leave to use his house at discretion; but unfortunately the noble lord's steward, underrating that discretion, and overrating his own domestic economy, made the exercise of the privilege too disagreeable to be often repeated. In a letter to Dean Colet, founder of St. Paul's school, Erasmus describes the surliness of the domestic, whom he designates under the characteristic name of Cerberus. His stay in London therefore was short, and he went to Oxford; where he studied at St. Mary's College, and became intimate with all who had any reputation in letters,—with Colet, Grocyn, Linacer, Williams, Latimer, Sir Thomas More, and others.

It speaks well for the learning of England at that time, that the studies of a man who ultimately became one of the lights of his age, and who has been looked up to by after-times as among the foremost in letters and theology in the splendid era of the Reformation, should in any degree have been directed by English scholars. Colet, Dean of St. Paul's, assisted him in divinity; Grocyn, Linacer, and Latimer, taught him Greek. For some time previously Oxford had been infested by a cabal who professed to adopt the sentiment of the elder Cato, and to oppose the teaching of Greek as a dangerous novelty. These enemies to innovation chose to call themselves Trojans; but before the arrival of Erasmus the Trojans had been successfully assaulted, yet without the conflagration of their university, and Greek literature had been restored with due honours. On his coming to Oxford, he complied with the fashion of the times by complimenting the college into which he had entered with a Latin ode. This ode extorted from a foreigner the acknowledgment of what he had previously thought incredible—that the genius of Germany was quite equal to that of Italy.

On the whole, Erasmus was so highly pleased with England, and with the friends he had gained there, that he frequently repeated his visits to an island where he had more admirers and patrons than even in the whole extent of the Continent. In addition to those already mentioned, he enumerates with gratitude, William Warham, Archbishop of Canterbury, Cardinal Wolsey, and Tunstall, Bishop of Durham. In a letter written to a friend in Italy, in December 1497, he says that instead of writing, he would long ago have been a sojourner in Italy, if his friend and patron Lord Montjoy had not carried him to England. "But you will ask, what is it that delights you so much in that country? If I have any credit with you, believe me, my friend, when I assure you, that nothing ever yet pleased me so much. The climate here is healthy and pleasant. I have met with humanity, politeness, and learning: learning, not trite and superficial, but deep and accurate; true old Greek and Latin learning; and so much of it, that but for mere curiosity I have no occasion to visit Italy When Colet discourses, I seem to hear Plato himself. In Grocyn I admire an universal compass of learning. Linacer's acuteness, depth, and accuracy are not to be excelled; nor did nature ever form anything more elegant, exquisite, and better accomplished than More. It would be endless to recount all; but it is surprising to think how learning flourishes in this happy country!" But notwithstanding this high-flown panegyric, constitutional restlessness seems to have possessed him, for he left England before the end of the year and went to Paris. His next visit to this country was in 1499, but his stay seems to have been short. On his return he was stripped of all his money by a custom-house officer before his embarkation, and his anger was extreme at being told, on application to have it returned, that it had been seized by legal process, and that there was no remedy. Yet, irascible as was his temper, his partiality for the country prevailed; for in 1500, on the publication of his "Adagia" at Paris, he added a panegyric on England, and dedicated the whole work to Lord Montjoy, who scarcely deserved the compliment, having been the occasion of his loss, by not instructing him in the laws and usages of the kingdom.

But in 1521, in a letter to the learned John Lodovicus Vives, he speaks in a less approving tone of Oxford, than on his first acquaintance with it. "About three years ago, the Bishop of Rochester, Chancellor of Cambridge, told me that now, instead of sophistical argumentations, sober and sound topics of discussion are handled by divines in their schools; discussions from which both professors and students went away, not only more learned but better men than when they came. The University of Oxford, at the instigation of certain monks, at first made some resistance to such practices; but they were controlled by the Cardinal's and the king's authority, because, evidently, they acted from mere envy of so illustrious and ancient a school."

A letter to a poetical friend on the Continent, dated 1499, exhibits the divine of two-and-thirty in no very mortified or ascetic frame of mind. "I am getting on very well in England. That Erasmus whom you once knew is well nigh become not the worst horseman in the world, even a pretty good hunter; and not a very awkward courtier—he pays his compliments with some degree of smoothness, smiles with some pretension to affability: and yet all this against the grain! What signifies that? It answers well enough. And you, too, if you are well, will hurry hither as fast as you can. Does such a clever fellow mean to live to old age among the muddling French? Your gout, forsooth, lays you by the heels. Send it to the devil, provided you do not go along with it. If you knew all that Britain has to offer, friend Faustus, you would put wings to your feet, and be here in a twinkling; or if your gout would not allow of your wearing them there, you might contrive to get yourself transformed into a Dædalus. I will only touch on one point out of many. Here are girls with angels' faces; so good-natured, that you would think your Muses were dowdies in comparison of them. Besides, there is a custom here which deserves to be lauded to the skies. Wherever you come, you are hailed with kisses by all: when you take your leave, you are sped with a repetition of kisses! if you return, having forgotten something, the

kissing ceremony comes over again! Your visit is of course returned, and you stand pledged to render back all you have received. On a chance meeting at a third place, kissing over again!—move in whatever direction you please, there is nothing but kissing! Were you once to taste how soft and smooth, how fragrant they are, you would not merely wish, like Solon, to travel for ten years, but to sojourn in England for the remainder of your days. But at present I will carry the joke no further; for after holding out such temptation, I shall depend on seeing you in a few days."

That our more reserved country-women of modern times may not be scandalized at Erasmus's playful levity, it may be proper to observe that the universality and publicity of the custom was the best security for its innocence; that what is now considered as a personal endearment, only warranted by natural affinity or some other close connection, was then nothing more than a general ceremony; and that even in later periods of more refinement, that mode of salutation was tolerated in all degrees of intimacy between the sexes in which the colder form of shaking hands is now allowed. In Shakspeare, at the Cardinal's banquet, King Henry the Eighth says to Anne Bullen,

> "Sweetheart,
> I were unmannerly to take you out,
> And not to kiss you."

This was anciently done at the beginning of some dances; in others, it was gravely and professionally noted down, as a component part of the *figure*. In a black-letter dialogue without dates, between Custom and Verity, concerning the use and abuse of dancing and minstrelsy, Custom puts this question to Verity:—

> "What foot would dance,
> If that when dance is done,
> He may not have at ladies' lips
> That which in dance he won?"

[To be continued.]

HURLEY HOUSE, OR LADY PLACE, BERKS.

[Back View of Lady Place, Hurley.]

THE views of this old mansion which accompany the present article are from drawings taken a short time ago, the materials of the house being then about to be sold by auction. We cannot therefore permit it to be added to "the things that were," without a passing notice of a place associated with our recollections of a great event in English history—the Revolution of 1688.

Hurley House is situated on one of the most picturesque windings of the Thames, and but a few hundred yards from the river, the grounds extending to the banks. It is about five miles from Maidenhead, and about four from Henley-on-Thames, not far from the Oxford road. The view from the hills above the village of Hurley is very fine; and the village itself is pleasantly situated in a valley, sheltered on both sides of the river by gently-descending and well-wooded hills. It has an antient and retired look, the houses are old and built partly of timber, with deep porches and seats, covered with mosses and vines, contrasting somewhat singularly with the smart inn and new toll-house at the entrance of the village. The church, which stands near the manor-house, is old and plain.

The site of Hurley House was a Benedictine monastery, founded in the reign of William the Conqueror, and dedicated to the Virgin; hence the house, which was built about the beginning of the seventeenth century, was termed Lady Place. The manor came into the possession of the Lovelace family in the sixteenth century; and the house was built by Sir Richard Lovelace, who was "knighted in the wars," as his epitaph declared, and who was reputed to have acquired a large sum of money on a sea expedition with Sir Francis Drake. His son was made Baron Lovelace of Hurley.

We have often rambled over the half-deserted rooms

of Lady Place, at a time when the possessor of the property seldom visited it. The house was a most perplexing labyrinth of dark rooms running one into the other, —and of "passages that lead to nothing."

The preceding view represents the garden front of the house. The hall, which was of large size and lofty dimensions, had two entrances, one from the garden, and one from the grounds leading to the Thames. The ceiling was covered with plaster mouldings of elegant flowing scroll-work, intermixed with fruit and flowers; and the walls were also ornamented with groups of musical instruments, books, &c., inclosed in borders, all of plaster. On one side of this spacious apartment was a staircase leading to a balcony running round it, from which were doors to rooms on the second story.

The rooms were panelled, as was also the hall or saloon; the panels being painted with landscapes, or else carved in arches and lozenges. The landscapes were about fifty in number, painted in a broad and free manner: they have been attributed to Salvator Rosa, but we believe they were the work of Antonio Tempesta.

The lower rooms, with their large bay windows and painted and carved panellings, must have been, especially when filled with the massive, antique furniture of the period, extremely rich, light, and imposing. But the upper rooms, which were not intended for show, presented a great contrast; they exhibited little either of elegance or comfort. The gutters from the roof ran through them, by which the external air was freely admitted at all seasons, as well as a copious share of the rain.

In the reign of James II., John, Lord Lovelace, "kept house" at Lady Place with a profuse hospitality that afterwards ate like a canker into his fortune. But it was under cover of this hospitality that the meetings of the noblemen of England were held, which resulted in the Revolution of 1688. The vault under the hall of the house was the burial vault of the monastery which formerly occupied the site: an inscription on the floor records that "Three bodies in Benedictine habits were found under this pavement." The ceiling of the vault is about six feet and a half high. In the view given below, the recess is exhibited where, it is believed, on local tradition, that various papers respecting the calling in of the Prince of Orange, &c. were signed. The following inscription records the chief facts connected with the history of the vault:—

"Dust and Ashes,
Mortality and Vicissitude to all.

"Be it remember'd, that the Monastery of Lady Place (of which this Vault was the *Burial Cavern*) was founded at the time of the great Norman *Revolution;* by which *Revolution* the whole State of England was changed.

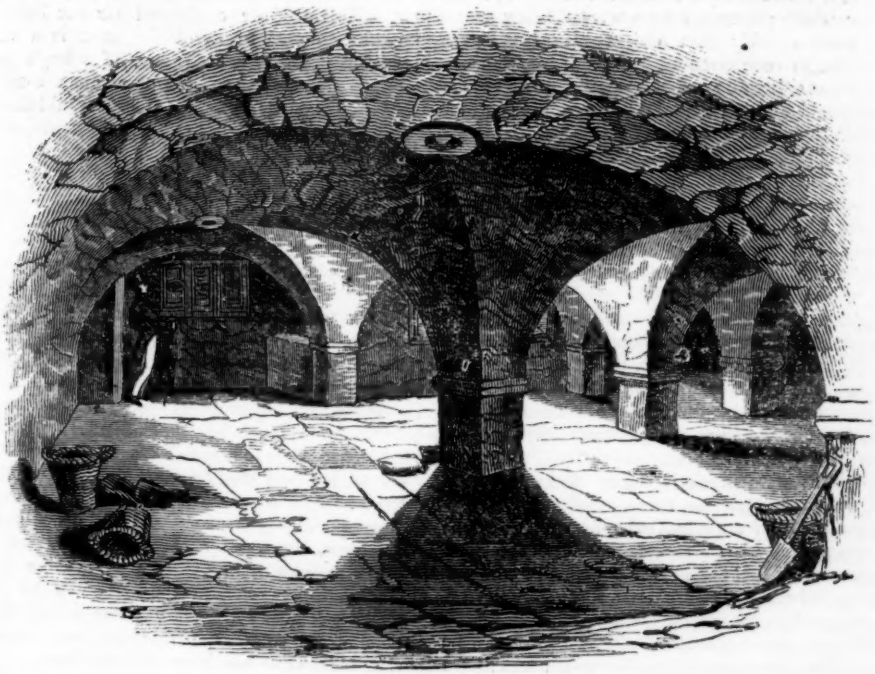
Hi motus animorum; atque hæc certamina tanta,
Pulveris exigui jactu compressa quiescunt.

"Be it also remember'd, that in this place six Hundred Years afterwards, the *Revolution* of 1688 was begun. This House was then in the Possession of the Family of Lord Lovelace; by whom private meetings of the Nobility were Assembled in the Vault; and it is said that several consultations for calling in the Prince of Orange were held in this Recess. On which account this Vault was Visited by that powerfull Prince after he had ascended the Throne.

"Be it also remember'd that on the 29th of May, 1780, this Vault was Visited by General Paoli, Commander of the Corsicans in the *Revolution* of that Island.

"Be it remember'd
that this Place was Visited by
their Majesties King George
the third & Queen
Charlotte, on monday
the 14th of November
1785."

Lord Lovelace was rewarded by King William with the post of Captain of the Band of Gentlemen Pensioners. He fitted up Lady Place with great splendour, and lived in a style which involved him so much in debt, that the greater portion of his estate was sold under a decree of the Court of Chancery. The house then passed through various hands. Last year, its dilapidation condemned it to be pulled down. On the occasion of the visit when the drawings were made, the person in charge of the house stated that the vault was not to be disturbed; although the materials of the house were to be sold by auction in a day or two afterwards. But at that time the vault was in a state of decay. It was originally very dry, but the rain had penetrated through the ceiling, and seemed to be doing considerable mischief.



[Vaults of Lady Place.]

DOMESTIC CHEMISTRY.—IV.

FIRE.

THE existence of man,—his necessary comforts and enjoyments,—nay, the very condition of the earth which he inhabits,—are all dependent in some way or other upon heat: there are but few substances manufactured, and but few processes performed in life, without its assistance; but in no circumstances is its agency more essential than in preparing animal and vegetable substances for the food of man. It will be convenient, therefore, to consider the nature of this important element, if such it may be called, before we treat of the further processes which are performed by its means. The phenomena presented by a common fire will be sufficient for our present purpose, and to them we will direct the reader's attention.

We perceive that before a fire can be kindled in our grates a certain series of processes is performed, which on further inquiry we shall find to be so many communications of heat from combustible bodies to other bodies combustible in a smaller degree. In using a flint and steel, the sudden blow which is given by the former to the latter occasions a small particle of steel to be struck off: this, however, is not all. One of the constant effects of percussion, or of friction, is the evolution of heat from the bodies struck or rubbed; but where the heat comes from, or in what way it is liberated from the substance, is yet a disputed point. Some think that heat is merely a state of vibration into which the particles of bodies are thrown by the effect of a blow or of friction; while others think that heat is a fluid forced out from between the particles in the course of these mechanical impulses. Be this as it may, however, the fact is undoubted, that percussion and friction tend to produce heat. The little particles of steel, then, are, in the act of being broken off, so intensely heated as to become red-hot:—these are the sparks which we see in the act of "striking a light."

These particles are not suffered to fall upon wood, or paper, or coal, but upon linen or cotton which has previously undergone the process of partial burning, by which some of the substances which form part of the linen or cotton are driven off, and a species of charcoal, or carbon, in a very attenuated state, is left behind: this forms *tinder*, which possesses the property of being heated to redness more quickly than coal, wood, paper, or unburnt linen, under such circumstances. If we were now to apply a piece either of wood or of paper to the red-hot tinder, we should find that it would not ignite; principally for this reason, that the combustible parts of wood or paper are combined with matters which retard rather than aid combustion, and therefore require a certain time to separate from those matters before the wood or paper will be ignited. We therefore employ a substance, such as sulphur or brimstone, which is almost purely combustible, and requires but a momentary contact with a red-hot body to become ignited. This sulphur, by being a sort of envelope to a thin piece of wood, communicates to the latter, during the act of burning, sufficient heat to drive off the unfavourable matters in the first place, and then to ignite the wood.

Here then we have the philosophy of a common brimstone match; but we must now consider other modes of procuring fire quickly. Some years ago, phosphorus boxes or phials were much in use for this purpose. A piece of phosphorus was put into a small phial, and was stirred about in it by a hot iron wire, by which the phosphorus was partially burnt in a confined portion of air, and the interior of the phial then contained a compound substance called *oxide of phosphorus*, formed by the union of the oxygen of the air with a portion of the phosphorus: the bottle was then tightly corked. To procure a light from this phial, a common brimstone match was inserted, and a small portion of the oxide withdrawn on the tip of a match, by which flame was instantly produced, on account of the strong affinity between sulphur and phosphorus; and the heat which attends the combination is sufficient to ignite these substances.

Another "instantaneous" light was the *Oxymuriate match*. Oxymuriate, or more properly chlorate, of potash, is a very singular salt in many respects, and among other properties it possesses that of instantly kindling, when mixed with sugar or other inflammable compounds, by the contact of a drop of sulphuric acid. Matches were prepared by dipping them in a preparation, of which chlorate of potash formed a leading ingredient; and a little bottle containing asbestos soaked in sulphuric acid was provided, in which to dip the match: the matches were dipped in sulphur previous to the chlorate of potash, and the latter was sometimes tinged with vermillion. 100 such matches were sold in ornamental cases of tin (moirée metallique), with the acid bottle, at prices which sunk gradually from fifteen shillings to one penny.

These contrivances have now become almost superseded by another, in which ignition is produced with great facility, by means of friction on a chemical substance. This is the common *Lucifer*—a good appellation, derived from two Latin words, *lux*, light, and *fero*, I bear. The end of a small match of wood is dipped into a paste consisting of chlorate of potash mixed with sulphuret of antimony and starch,—a compound which takes fire with great rapidity by mere friction, for on drawing the end of the match quickly through a folded piece of sand-paper, the substance immediately takes fire. But the sulphureous-antimonial vapour emitted during the combustion is dangerous to a person with weak lungs.

Prometheans consist of a roll of paper containing at the larger end a portion of chlorate of potash paste and a small glass bulb full of sulphuric acid: on striking the end the bulb is crushed, and the acid, coming in contact with the chlorate paste, ignites it.

There are many other modes of producing a light by means of friction, percussion, or compression. The savage kindles a fire by rubbing two pieces of wood together: a blacksmith can kindle a fire by hammering a piece of iron until it is hot: air can be compressed into such a small space, that the heat, which is condensed with the air, is liberated, the condensed air not having sufficient capacity to contain it. This latter is a very pleasing experiment. Suppose the end of a boy's popgun were stopped up, and the piston or rammer worked air-tight through the bore, no amount of force would drive the piston quite to the bottom, because the air contained within the bore, however much it might be compressed, would always occupy some space. Now it is found that under such circumstances a considerable quantity of heat is evolved, which increases as the compression increases. This principle has been taken advantage of thus:—a piece of *amidou*, or German tinder, is placed in the lower part of a piston which works air-tight in a brass tube; and when the contained air is much compressed, the heat evolved thereby kindles the amidou, from which a light may be procured by means of a match, when the piston is withdrawn.

When, by any of these processes, we have kindled a match, we apply it to paper or shavings, which are then succeeded by wood, and lastly by coals:—it will be observed that coal kindles more slowly than wood, but the former burns longer than the latter; and that wood kindles more slowly than paper, but burns longer. When the coals are kindled, we are accustomed at different times to adopt various contrivances for continuing or augmenting the heat of the fire, such as stirring it up, blowing it with bellows, &c.; and we see that some portions of the contents of the grate emit flame, while the remainder emit red heat without flame. It will be interesting to consider the nature of these processes.

All vegetable substances contain, along with other ingredients, a portion of carbon and a portion of hydrogen, the former of which is a solid, and the latter, in its free state, a gas. Now both of these bodies are termed *combustibles;* that is, they are capable of combining chemically with oxygen gas in such an energetic manner as to emit both light and heat: for this reason oxygen is termed a supporter of combustion, and its presence is necessary in order that carbon or hydrogen should burn, or enter into combustion. There are other combustibles besides carbon and hydrogen, and other supporters of combustion besides oxygen, but we will confine our attention to those three bodies.

Coals, wood, and paper are all of vegetable origin, and all contain carbon and hydrogen. When any one of these substances is heated to a certain temperature, the hydrogen which it contains becomes sufficiently liberated from the other ingredients to combine with the oxygen of the atmosphere; for the latter contains oxygen as one of its constituents, the other being nitrogen. In this way a double separation is brought about: viz., the hydrogen is separated from the other ingredients which form coal, wood, &c., and the oxygen is separated from the nitrogen, which, with it, forms our atmosphere. The effect of the combination of oxygen and hydrogen is the production of water in the state of vapour. We have stated in a former paper that water consists of two measures of hydrogen and one of oxygen: now it is found that in all such processes of combustion as we are here considering, the surrounding air loses one part of its oxygen for every two parts of hydrogen which the burning body loses. The water thus produced ascends in the form of steam, and is condensed into minute drops of water on coming in contact with a cold body. Now at the instant that the combination of the two gases takes place, light and heat are thrown out, which are visible to us in the form of flame, and the production of which we may thus illustrate:—two measures of hydrogen and one of oxygen combine to form an equal weight of water, but the gases occupy many hundred times as much space as the water will occupy: the heat, therefore, which was combined with the gases is set free when those gases are so enormously condensed, and the result is that a large quantity of heat is given out, and becomes sensible to us in the form of light and heat, or flame. This is one mode in which the production of flame has been accounted for, but the point has not yet been definitely settled.

The flame which we are accustomed to see is, however, seldom the result of the combination of oxygen and hydrogen alone: there is generally a portion of carbon combined with hydrogen, in the form of a compound gas, and it is the combination of those two with oxygen that generates the flame:—thus, the gas which lights our streets and shops is hydrogen and carbon mixed; and when we apply a light to the end of a pipe containing the gas, the latter becomes sufficiently heated to combine with the oxygen of the atmosphere, and thus to give out light and heat; and the results of the combustion are steam and carbonic acid gas.

We must now consider the red portion of our common fires: this is coal deprived of its hydrogen, which has escaped in the production of flame, and thereby left little but carbon behind: the carbon, when strongly heated, combines with the oxygen of the atmosphere and forms carbonic acid gas, which ascends the chimney; but the combination cannot produce flame, because no hydrogen is present; a bright red light being alone emitted. A piece of coal emits red light and heat long after it has ceased to yield flame, chiefly on account of the slowness with which the carbon is consumed. What we term *coke* is coal which has been deprived of all its hydrogen, and it is for this reason that coke yields no flame.

By a little consideration we shall see that the act of stirring a fire supplies it with additional oxygen, through the medium of the atmosphere. When the coals are bedded closely together in the grate, the air can act on the outside of the mass, but cannot intimately mix with the coals: we therefore break and stir up the latter, by which air can gain entrance to every part, and thus feed the carbon and hydrogen with a fresh supply of oxygen for the purpose of combustion.

It is a common opinion that day-light acts injuriously on a fire, and we frequently see a screen or an inverted shovel placed before it to shield it from the light of a window. It has been lately proved that this is not a vulgar error, as some have supposed, for there are certain chemical rays combined with the light of the sun which retard combustion.

The practice of wetting fuel previous to placing it on a fire is wasteful, on this account:—the water which we throw on the fuel must be converted into vapour, and must escape, before the fuel can become kindled; and in the act of vaporising, it robs the other parts of the fire of a large quantity of heat, which is thus lost to any useful purpose. A given quantity of water, in order to be converted into steam, must have such an additional quantity of heat as would impart to it a temperature of upwards of 1000 degrees if it could continue in the liquid state. In the case of the wetted fluid, therefore, this large amount of heat is abstracted from the fire, and thus diminishes its value.

When a fire is first lighted, we see a quantity of smoke rise from it and ascend the chimney, which quantity is diminished as the fire becomes clearer. Now this smoke consists of a portion of unburnt hydrogen combined with unburnt particles of carbon, which are not heated to a sufficient degree to be ignited. The air which exists in a chimney becomes heated, and, as a consequence, lighter than it was before, and so ascends the chimney, carrying with it the unconsumed fuel, which we recognise as smoke. The production of smoke is as much a loss as it often is a nuisance, for we are deprived of all the heat which it would yield if it were consumed. We place coals on the top of a fire, by which some of the hydrogen, becoming warm and liberated, ascends before it can get ignited; but if we could by any means supply a fire with coals from beneath, the liberated hydrogen would have to pass through the burning coals before it could ascend.

This subject is closely connected with the contrivances for regulating the supply of air to a fire. If the fire be low and dull, it may frequently be invigorated by the forcible ejection of wind upon it from a bellows. The action of this instrument is illustrative of the pressure of the atmosphere: two boards, similar in size and shape, are connected at their edges by a piece of leather, which admits of their being brought near to, or far from, each other, and which inclose a portion of air between them. Suppose now that the two boards be close together, and that we separate them by means of the handles, the interior space would be almost devoid of air, because we suppose the edges to be well secured: the external air, however, rushes in through a hole in the under board to fill the vacated space, until the density of the internal and external air is equal: on closing the boards, the air cannot escape by the way it entered, because a leather flap or valve falls over the hole; it therefore passes through a nozzle which is inserted into one end of the cavity, and thus enters the fire. If we stop the end of the nozzle with the finger, the boards cannot be brought together, because the confined air has no means of escape.

When we see a plate of metal placed across the upper part of a fireplace, we may consider it to act as a bellows or blower, in this way:—there is always a current of cold air flowing towards an open fire, and as there is usually a considerable space open above the fire, the air enters the chimney, and produces a bad effect in two ways: it

interferes with the rapidity of the ascent of the heated air, smoke, aqueous vapour, &c., from the fire, on account of its being somewhat heavier than those bodies; and it tends to reduce the temperature of the upper part of the fire, which, as we have said, ought to have the highest temperature. Now by the interposition of a screen across this opening, most of the air which enters the chimney must pass through the fire, and thus, besides supplying the required share of oxygen for the purpose of combustion, becomes heated and lightened, so that it ascends the chimney with greater facility. Very lofty chimneys act as blowers: if one chimney be 20 feet high, and another 40, and both be filled with heated air, the air in the longer chimney has twice the ascensive force of that contained in the shorter one, because there is twice as much air striving to gain a more elevated position. We find that an attic chimney sends the smoke into the room more frequently than a kitchen chimney, chiefly on account of the ascending current, which prevents the descent of the smoke, not being so powerful in the former case as in the latter. The lofty chimneys which we see attached to glasshouses and other manufactories where intense fires are employed, give rise to a powerful ascending current of heated air, by which new supplies of oxygen are admitted to the burning fuel with great rapidity.

The bad effect of an open fireplace led to the adoption, some years ago, of "register stoves," in which a flap or screen is drawn across the lower part of the chimney, with a small hole in it which may be opened or closed at pleasure by means of a valve or trap; so that but little cold air can ascend the chimney, the valve being opened sufficient only to admit the passage of smoke from the fire.

The great heat which can be procured in German and other close stoves arises from the circumstance that the external air must pass through the burning fuel before it can ascend the chimney.

We shall take another opportunity of describing the modes of warming buildings by heated air, hot water, &c.

A Chinese Dinner.—We were conducted into another room, and took our places at little four-cornered tables, each meant for six persons. The tables were placed together in the form of a half-circle, and the side towards the centre remained unoccupied. At the middle table sat the host, and at every other table sat a Chinese, who did the honours of it. The empty sides of the table, where no one sat, were hung with scarlet drapery, beautifully worked in embroidery of gold and different coloured silks; Chinese flowers, but not of very striking forms, furnished the pattern. On the front edge of each table were placed the finest fruits in little baskets, with beautiful flowers stuck between them. Besides these, the whole table was covered with little cups and plates, which were ranged with great precision, and contained fruits, preserves, confectionery, slices of bread and butter, with small birds cold, and hundreds of other things. An extraordinary degree of art had been expended in the arrangement of those articles; amongst the rest were whole rows of little plates, filled with elegantly-raised three and four cornered pyramids, composed of little bits of pheasants, larded geese, sausages, and so forth. Here stood plates with small oranges; there preserved plums; and here again almonds. Various little seeds of different colours were served upon shallow saucers, so arranged however that each colour occupied a particular field. We here recognised a kind of quince seed, of very delicate flavour; chick-peas, which, if eaten frequently, are said to produce a very bad effect; and chestnuts and hazel-nuts, which come from the province of *Pecheli*, and greatly excel our fruits of the same kind. There were, moreover, grapes, which likewise came from the northern provinces of the empire; with preserved ginger, citrons, and lemons. After making but a short stay in China, one is accustomed to see daily and hourly that the Chinese conduct all their arrangements in a different style and manner from ourselves; it was thus also with the repast, for we began with the dessert. By way of cover, three small cups are placed before each seat; the first on the left hand is filled with soy, which the Chinese add to almost every sort of food; the second serves for the ordinary eating; and in the third is a little spoon of porcelain for the soups. In front of these three cups, which are ranged in a line, lie the two round little chop-sticks, which in rich houses are made of ivory. It is extremely difficult for strangers to get at their food with these sticks, and the Chinese were amused with our unskilfulness; one was overheard to whisper, 'Here are wise Europeans for you; they cannot so much as eat properly.' Mr. Lindsay understood him perfectly. Instead of napkins, small three-cornered pieces of paper are placed near the covers; these are ornamented with stripes of red paper, and are used by the Chinese to wipe their hands. The dinner began by the host's inviting us to eat of the finer dishes; whilst we were eating them, he kept calling our attention to the flavour or the rarity of this or that thing: and the mode of eating was to convey the food to the mouth, with the two sticks, out of the dish; for a small bowl was the largest vessel placed upon the table during the whole entertainment. The Chinese place no cloths upon the tables, but instead, so soon as the course is finished, the whole board is removed, and a new surface, as it were, with fresh things, is served. As soon as the first course was removed, another small cup was added to each cover; this was used for drinking hot samtschu, a fermented liquor made of rice, which at a Chinese table supplies the place of wine, and which is always served boiling; servants walk round with large silver cans, and help everybody to this nectar, which, principally on account of its heat, begins very soon to operate. The Chinese, in drinking wine, observe nearly the same rules as the English. They challenge to drink, then hold the cup with both hands, and, after wishing each other health and happiness, drink it off at a draught; whereupon they turn the inside of the cup towards the person with whom they are drinking, and show that they have drained every drop. On one occasion, when I did not wish to drink off a whole cup, my Chinese friend held his own constantly before me, and kept making signs till I had finished mine. Samtschu is in general of an insipid taste; they have, however, a great many kinds of it, which are constantly changed at the tables of the rich, and I tasted one variety which might be placed alongside of the best brandy. So soon as the first division of the dinner, consisting possibly of sixty ragouts, was over, the soups appeared; these were placed in small bowls, in the middle of the table, and every man ate, with his little porcelain spoon, out of the dish. In this way five or six different soups were served in succession, and between them various other things were placed before the guests in little cups; amongst the rest, pastry, prepared in many ways, articles of confectionery, and strong chicken-hashes. Between the different grand-divisions of the dinner, tea was handed round, and tobacco smoked; during which we were enabled to rest ourselves, so as to begin again with fresh vigour. After several courses, five small tables were placed outside of the half-circle of the original tables; these were completely covered with roasted pork and birds of all sorts. Then ten cooks came into the room, clothed all alike and very tastefully, and began carving the roasts. Two placed themselves before each table, and commenced, with long knives, to sever the hard-roasted skin of all these viands, which was done most skilfully. Other servants, who stood in front of the tables, received the little bits, into which all these roasts were cut, upon small plates, and then placed them on the middle of our tables. At the end of the whole meal, the cooks came again into the room, and returned thanks for the honour which had been done them in being permitted to cater for the illustrious company. I shall here close the description of this dinner, which perhaps has wearied the indulgent reader more than it did us; yet full six hours were we obliged to sit at it, and many hundreds of dishes were served up.—*Dr. Meyen's Voyage round the World.*

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